What is claimed is:

1. The method of image processing, comprising the steps of:

providing an original image as a matrix of discreet picture elements (pixels),

splitting said original image into n frequency channels, each of said n channels being presented by an image matrix of the same size as said original image,

detecting edges, and

assembling an output image from said n frequency channels taking said detected edges into account,

wherein said splitting said original image is performed into a low frequency channel and n-1 high frequency channels,

wherein said detecting edges is performed by

calculating in each of said n-1 high frequency channels for each pixel a correlation value between a processed pixel and its neighboring pixels followed by

comparing said correlation value with correlation values for the corresponding (by their location in the image) pixels in other said high frequency channels and with a first threshold value for this channel; and

forming weighting coefficients based on the results of said comparing for each pixel of each of n-1 high frequency channels, and

said assembling said output image is made by summing each pixel from said low frequency channel with all the corresponding (by their location in the image) pixels of said n-1 high frequency channels multiplied by their weighting coefficients.

2. The method according to claim 1, wherein said forming weighting coefficients for each pixel of said each of said n-1 high frequency channels is made by comparing said corresponding correlation value to said first threshold value.

3. The method according to claim 2, wherein a weighting coefficient takes a minimal value for correlation values that are significantly smaller than said first threshold value; said weighting coefficient smoothly increases from its minimal value to its maximal value for correlation values that are close to said first threshold value; and said weighting coefficient takes its maximal value for correlation values that are significantly larger than said first threshold value.

4. The method according to claim 2, wherein a weighting coefficient takes a minimal value for correlation values that are significantly smaller than said first threshold value; said weighting coefficient smoothly increases from its minimal value to its maximal value while said correlation value increases to a second threshold value, said second threshold value being equal to a product of said first threshold value by a pre-defined coefficient; and said weighting coefficient smoothly decreases from its maximal value to its limit value while said correlation value is larger than said second threshold value.

5. The method according to claim 1, wherein m of said n-1 high frequency channels, where $2 \leq m \leq n-1$, are different from one another in a direction of their principal passing only.

6. The method according to claim 5, wherein said forming weighting coefficients for each pixel of each of said m high frequency channels is made by comparing said corresponding correlation value to said first threshold value and to said correlation values for corresponding (by their location in the image) pixels of other m-1 high frequency channels.

7. The method according to claim 1, wherein each of said picture elements (pixels) is represented by a scalar value characterizing, for example, image intensity at said pixel.

8. The method according to claim 7, wherein said scalar value is calculated for each pixel by multiplication of said pixel value by a weighted sum of its neighboring pixels.

9. The method according to claim 8, wherein m of said n-1 high frequency channels, where $2 \leq m \leq n-1$, are different from one another in a direction of their principal passing only, and anisotropic weights are used for calculating said weighted sum of said neighboring pixels, a direction of said anisotropy corresponding to said direction of principal passing for a corresponding processed frequency channel.

10. The method according to claim 7, wherein said threshold value for each of said n-1 high frequency channels is determined by analyzing distribution of pixel values in an image of a corresponding processed frequency channel.

11. The method according to claim 7, wherein said threshold value for all said frequency channels is determined by analyzing distribution of pixel values of said original image.

12. The method according to claim 1, wherein said picture element (pixel) is represented by a vector.

13. The method according to claim 12, wherein said correlation value for each pixel is calculated as a scalar product of said pixel vector by a weighted sum of vectors representing its neighboring pixels.

14. The method according to claim 13, wherein m of said n-1 high frequency channels, where $2 \leq m \leq n-1$, are different from one another in a direction of their principal passing only and anisotropic weights are used for calculating said weighted sum of said neighboring pixels, a direction of said anisotropy corresponding to said direction of principal passing for a corresponding processed frequency channel.

15. The method according to claim 12, wherein said threshold value for each of said n-1 high frequency channels is determined by analyzing distribution of absolute values of vectors representing pixels of an image of a corresponding processed frequency channel.

16. The method according to claim 12, wherein said threshold values for all high frequency channels is determined by analyzing distribution of absolute values of vectors representing pixel values of said original image.

17. The method according to claim 1, wherein correlation values for several neighboring pixels are smoothed before said forming said weighting coefficients, said smoothing being implemented at least in one of n-1 high frequency channels.

18. The method according to claim 17, further including non-linear transforming said correlation values prior to said smoothing said correlation values, said non-linear transforming remaining unchanged those of said correlation values that are smaller or close to said first threshold value, and decreasing those of said correlation values that are significantly larger than said first threshold value.

19. The method according to claim 1, further comprising smoothing said weighting coefficients over neighboring pixels, said smoothing being implemented at least in one of said n-1 high frequency channels.

20. The method according to claim 1, wherein said original image is a p-dimensional matrix of said picture elements, where p is greater than or equal to 3.

21. The method according to claim 1, wherein different threshold values are used for different parts of said image, said different threshold values being used to form said weighting coefficients at least in one of said n-1 high frequency channels.

22. The method according to claim 21, wherein a picture element of said picture elements is represented by a scalar value and said threshold values for said different parts of said image and different high frequency channels are determined by analyzing distribution of pixel values in a corresponding part of said image of a corresponding frequency channel.

23. The method according to claim 21, wherein a picture element of said picture elements is represented by a vector and said threshold values for said different parts of said image and different frequency channels are determined by analyzing distribution of absolute values of vectors representing pixels in a corresponding part of said image of a corresponding frequency channel.